EQ281/8 & EQ282/8
Digitally Controlled
1/3-Octave Equalizers

operation manual

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INTRODUCTION

ADVANTAGE® **EQ281/8** & **EQ282/8** provide one or two channels of digitally controlled 1/3-octave equalization in a single rack-space unit. Input levels and 28 filter bands, as well as high-pass & low-pass filters, are all adjusted via computer. Eight presets (per channel) are recalled via contact-closures, third-party controllers, or computer. Filter design utilizing Constant-Q technology guarantees precise system tuning with less filter interaction, better filter combining, and constant filter bandwidth at any setting. EQ281/8 & EQ282/8 are covered by a five-year warranty.

EQ281/8 & EQ282/8 features include:

- single-channel (EQ281/8) & dual-channel (EQ282/8) models
- 28 digitally controlled filters (per channel) on ISO frequencies
- Constant-Q technology provides precision system tuning
- filters adjustable ±12dB in 1dB steps or ±6dB in 0.5dB steps
- channel input levels adjustable ±12dB in 1dB steps (plus off)
- high-pass filters (12dB per octave) adjustable 9.1Hz~171.9Hz
- low-pass filters (12dB per octave) adjustable 1.9kHz~34.7kHz
- eight non-volatile memory presets available (per channel)
- logic inputs allow selection of presets via contact-closures
- RS-232 serial port for computer or third-party controllers
- PC control software for Windows® 95 & serial cable included
- device number switch & link port for controlling multiple units
- baud rate switch provides choice of communications rates
- front panel indicators for peak, bypass, & selected presets
- balanced inputs and outputs on plug-in barrier strip terminals
- optional external pink-noise 'masking' generator (PNG200)
- modular ±12 Volt DC Out jack for powering external devices
- incorporates **AES** recommended grounding practices
- CE marked and **UL** / **C-UL** listed power source
- covered by Five-Year "Gold Seal" Warranty

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After reading this manual, if you have any questions or need technical assistance, please call Biamp Systems toll-free **1-800-826-1457**.
E-mail: biamp@biamp.com **Web-Site:** www.biamp.com

FRONT PANEL

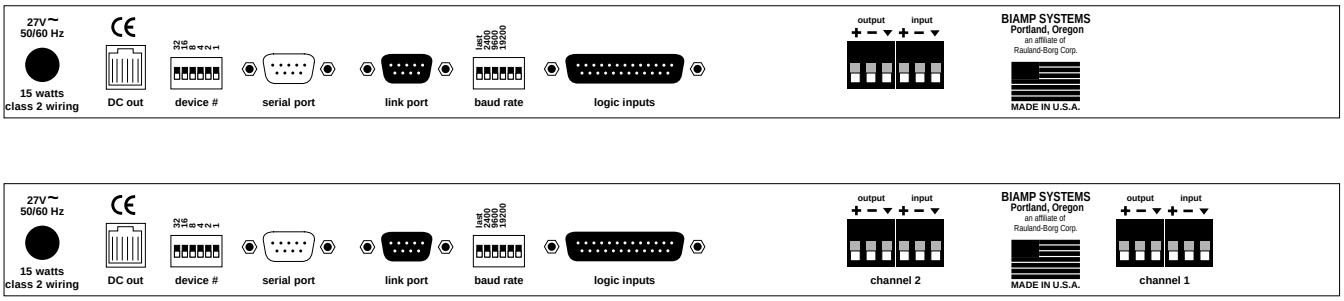
Preset: This seven segment LED display indicates which preset is currently selected. There are eight presets available (per channel), which can be recalled from non-volatile memory via RS-232 or Logic Input control. Each preset stores settings for input level, 28 filter bands, a high-pass filter, and a low-pass filter. These settings are adjusted, and presets are stored, via RS-232 control, using the PC Control Software and serial cable provided with the equalizer (see Setup on pg. 4). The equalizer may also be controlled via RS-232 from third-party controllers.

Peak: This red LED indicates output level has reached +14dBu balanced (+8dBu unbalanced). When the Peak indicator lights, 10dB of headroom remains before clipping. If increased signal levels or equalizer adjustments cause the Peak indicator to light frequently, reduce the equalizer input level to avoid distortion caused by overdriving the equalizer output section.

Bypass: This red LED indicates the equalizer has been bypassed via RS-232 control. When bypassed, all filters are temporarily set flat, the high-pass & low-pass filters are set to their extremes (9.1Hz & 34.7kHz respectively), and the equalizer input levels are set to unity gain (see Setup on pg. 6).

On: This red LED indicates power is applied to the equalizer.

REAR PANEL



AC Power Cord: The power transformer provides 27 Volts AC to the equalizer, and is detachable via a 5-pin DIN connector. The equalizer has two internal 'self-resetting' fuses (there are no user servicable parts inside the unit). If the internal fuses blow, they will attempt to re-set after a short period. However, this may be an indication that the equalizer requires service.

DC Out: This 6-pin Modular jack supplies ±12 Volts DC, for powering external accessory devices. The EQ281/8 DC Out provides up to 100mA maximum current. The EQ282/8 DC Out provides only 10mA maximum current.

Device #: This 6-gang DIP switch allows an equalizer to be assigned a specific device number. Up to 64 different device numbers (0~63) may be assigned to allow RS-232 control of multiple ADVANTAGE® products in a common system. From the factory, an equalizer is assigned Device # 1.

Serial Port: This 9-pin Sub-D (male) connector provides an RS-232 Serial Port for remote control via computer or third-party controllers (see RS-232 Control on pg. 8). The Serial Port has the following pin assignments (left-to-right & top-to-bottom): **Pin 1)** not used; **Pin 2)** Receive Data (RxD) input; **Pin 3)** Transmit Data (TxD) output; **Pin 4)** Data Terminal Ready (DTR) output; **Pin 5)** Ground; **Pin 6)** not used; **Pin 7)** Request To Send (RTS) output; **Pin 8)** not used; **Pin 9)** not used. PC Control Software and a serial cable are provided for programming via Windows® 95 (see Setup on pg. 4). ***NOTE:*** *The Serial Port can also transmit commands which are received via the Logic Inputs (see Setup on pg. 5).*

Link Port: This 9-pin Sub-D (female) connector provides a Link Port for RS-232 control of multiple ADVANTAGE® products (see RS-232 Control on pg. 9). The Link Port of one device simply connects to the Serial Port of the next device (and so forth). Link cables are available as an option (Biamp #909-0057-00). ***NOTE:*** *All but the final device in a system should have its 'last' switch down (see Baud Rate).* The Link Port has the following pin assignments (right-to-left & top-to-bottom): **Pin 1)** not used; **Pin 2)** Transmit Data (TxD) input; **Pin 3)** Receive Data (RxD) output; **Pin 4)** not used; **Pin 5)** Ground; **Pin 6)** not used; **Pin 7)** not used; **Pin 8)** not used; **Pin 9)** not used. ***NOTE:*** *The Link Port can also transmit commands which are received via the Logic Inputs (see Setup on pg. 5).*

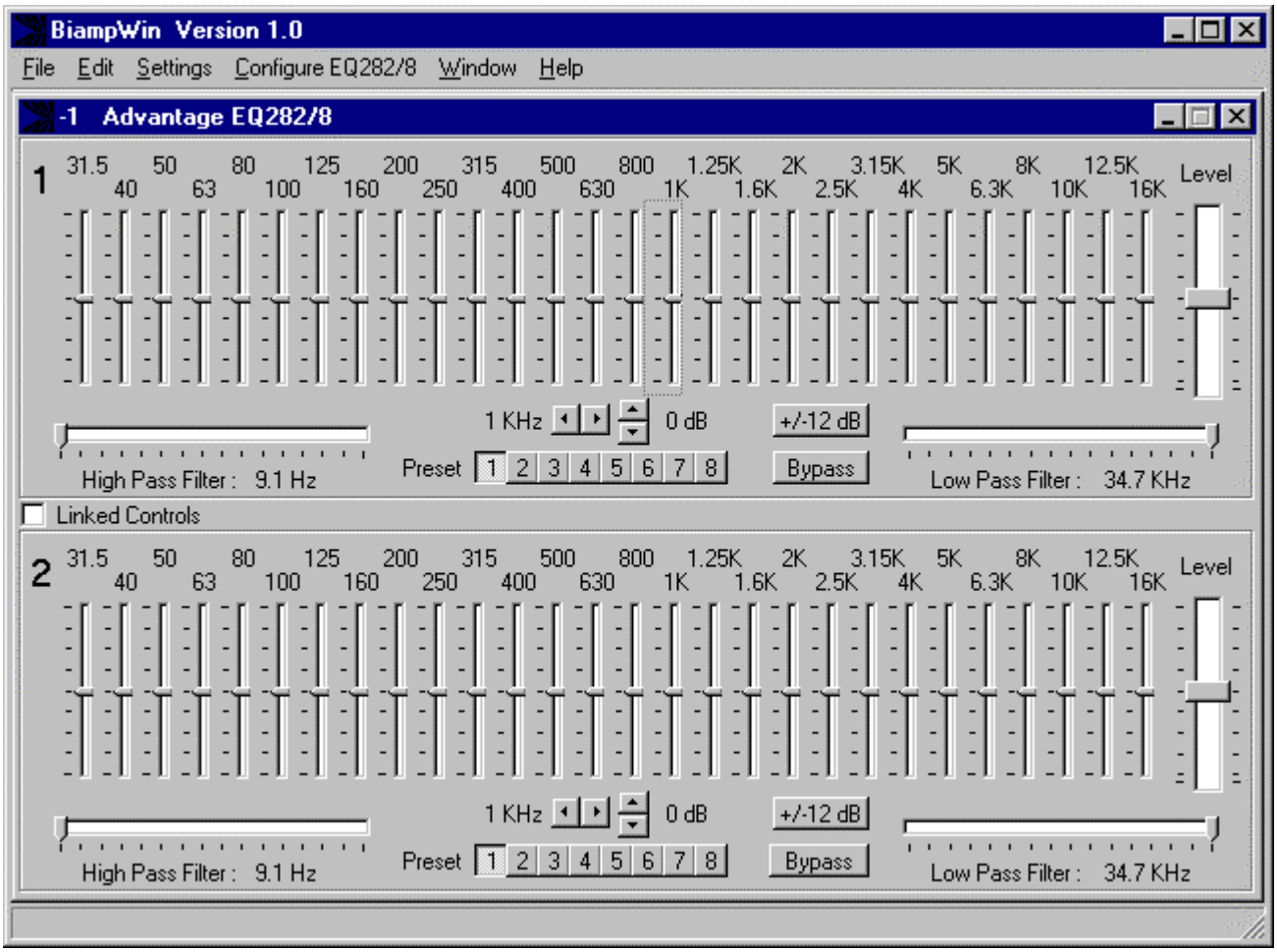
Baud Rate: This 6-gang DIP switch allows an equalizer to be assigned a specific communications baud rate. Baud rates available are 2400, 9600, & 19200 bps. The factory default is 9600 bps. Only one baud rate should be selected at a time, by raising the corresponding switch. The two switches on the far right are not used. The switch on the far left (labelled 'last') is used when connecting multiple devices in a 'Link Port to Serial Port' configuration (see Link Port). From the factory, the 'last' switch is up. When connecting multiple devices, the 'last' switch must be switched down on all devices except the final ('last') device in the system (the device with no Link Port connection).

Logic Inputs: This 25-pin Sub-D (female) connector provides 16 logic input terminals, plus 9 ground terminals (see Logic Inputs on pg. 7). Once equalizer settings are adjusted (and presets are stored) via RS-232 control, the Logic Inputs can be used to recall presets from non-volatile memory using simple switches or contact-closures. The EQ281/8 Logic Inputs have the following pin assignments (right-to-left & top-to-bottom): **Pins 1~8)** recall Presets 1~8; **Pins 9~16)** no operation; **Pins 17~25)** switch ground points. The EQ282/8 Logic Inputs have the following pin assignments (right-to-left & top-to-bottom): **Pins 1~8)** recall Presets 1~8 (channel 1); **Pins 9~16)** recall Presets 1~8 (channel 2); **Pins 17~25)** switch ground points. Logic Input functions may be programmed using the PC Control Software and serial cable provided with the equalizer (see Setup on pg. 4).

Output: These plug-in barrier strip terminals provide a balanced line-level output (per channel). For balanced connections, wire high to (+), low to (-), and ground to (▾). For unbalanced connections, wire high to (+) and ground to (▾), leaving (-) unconnected. Signal level will be reduced by 6dB when outputs are unbalanced.

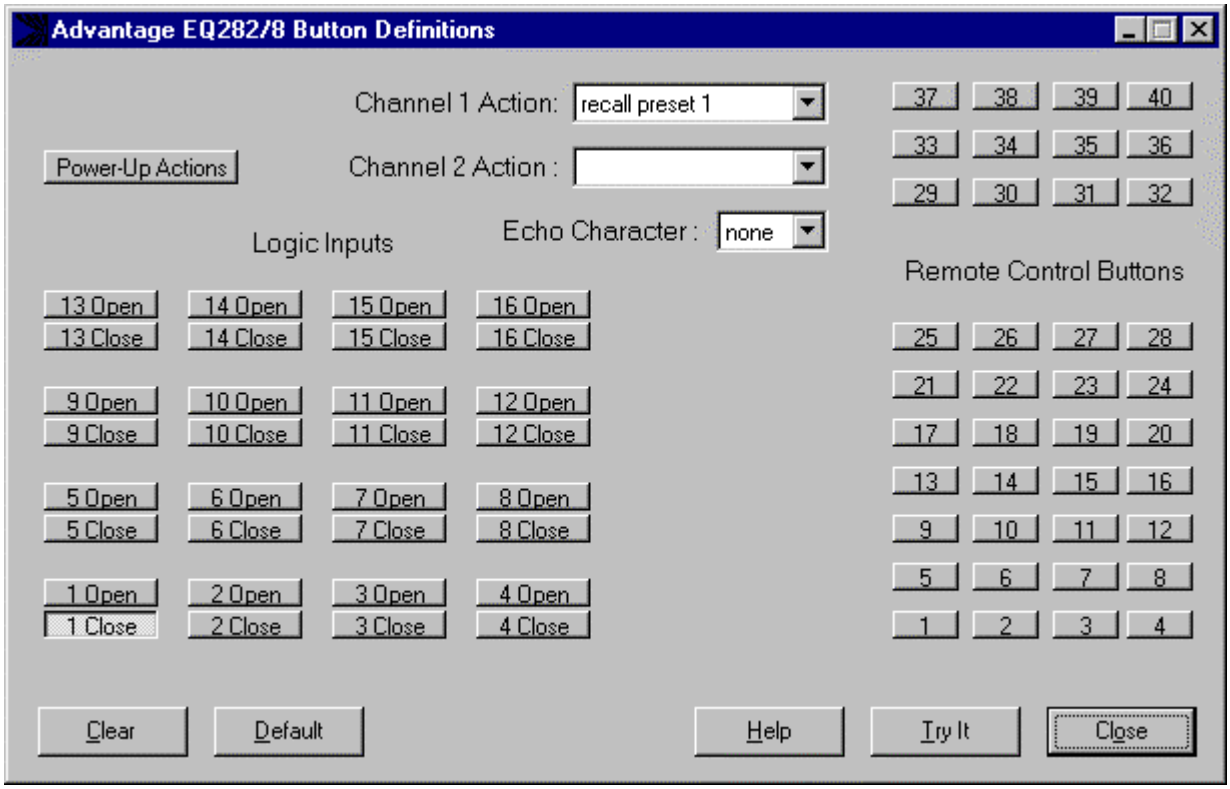
Input: These plug-in barrier strip terminals provide a balanced line-level input (per channel). For balanced connections, wire high to (+), low to (-), and ground to (▾). For unbalanced connections, wire high to (+), and ground to both (-) & (▾). The Input level is adjustable via RS-232 control, and has a range of ±12dB in 1dB steps, plus off.

All equalizer parameters are adjustable using the Windows® 95 'PC Control Software' and serial cable provided with the unit. The PC Control Software provides programs for the EQ281/8 & EQ282/8, as well as other ADVANTAGE® products. The equalizer programs include three different control screens (Main, Button Definition, & Configuration Options), which are described on the following pages. Once the software is started (and Comm Port Configuration is set), the three control screens are accessable through the drop-down menus at the top of the opening screen. The Main screen appears whenever an equalizer file is opened. Button Definition & Configuration Options screens are then available from the Configure EQ282/8 (EQ281/8) menu. The File menu provides functions such as open, close, save, etc. The Edit menu allows copy/paste & flat-curve functions. The Settings menu recalls the Comm Port Configuration screen. The Window menu arranges the active product screens. The Help menu explains the available adjustments. To install PC Control Software: Select 'Run' from Windows® 95 'Start' menu, and enter A:\SETUP. System Requirements: Windows® 95 with 8M of RAM & 2M of available hard disk space (serial port required for 'on-line' operation).


BiampWin Version 1.0
File Edit Settings Configure EQ282/8 Window Help
-1 Advantage EQ282/8
1
31.5 40 50 63 80 100 125 160 200 250 315 400 500 630 800 1K 1.25K 1.6K 2K 2.5K 3.15K 4K 5K 6.3K 8K 10K 12.5K 16K
Level
1 KHz
0 dB
+/-12 dB
Preset 1 2 3 4 5 6 7 8
Bypass
High Pass Filter : 9.1 Hz
Low Pass Filter : 34.7 KHz
Linked Controls
2
31.5 40 50 63 80 100 125 160 200 250 315 400 500 630 800 1K 1.25K 1.6K 2K 2.5K 3.15K 4K 5K 6.3K 8K 10K 12.5K 16K
Level
1 KHz
0 dB
+/-12 dB
Preset 1 2 3 4 5 6 7 8
Bypass
High Pass Filter : 9.1 Hz
Low Pass Filter : 34.7 KHz

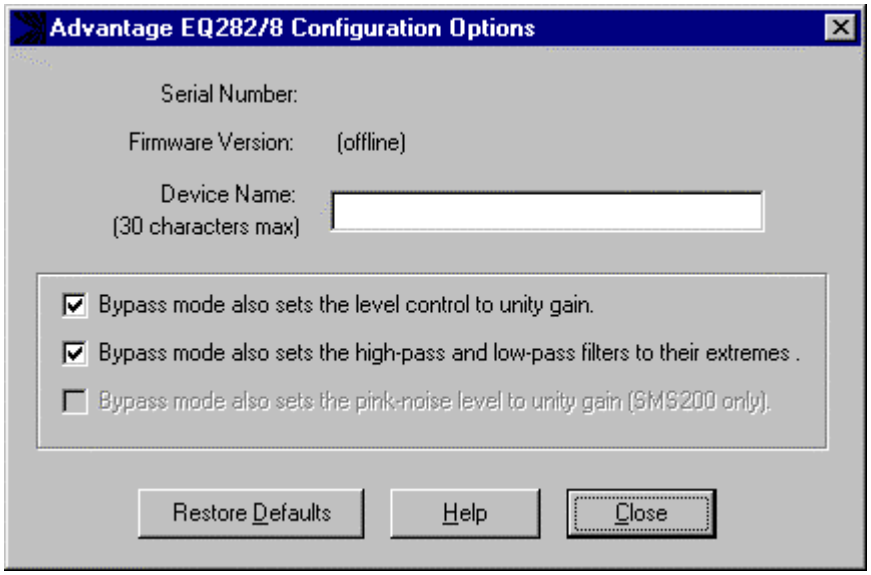
MAIN SCREEN

The Main Screen is used to adjust the equalizer (channel) input level, 28 filter bands, high-pass filter, and low-pass filter settings, as well as to store & recall eight memory presets. Adjustments are made with the computer mouse (or keyboard). Settings are adjusted by dragging the corresponding 'faders' (or left-clicking the arrow buttons). Each filter band fader provides 25 gain steps, in 1 dB increments (±12dB). Left-clicking on +/-12 dB will instead select 0.5 dB increments (±6dB). Left-clicking above or below a fader will adjust the gain three steps at a time. High Pass & Low Pass filters provide 16 frequency steps. Left-clicking to the left or right of the fader will adjust the frequency 4 steps at a time. The Level fader provides 26 gain steps (±12dB, plus off). Right-clicking in the filter band area opens a drop-down menu, which allows copy/paste & flat curve functions. Left-clicking a Preset button will recall the corresponding preset from non-volatile memory (presets are stored automatically). Left-clicking the Bypass button will temporarily bypass filter & level settings (see Configuration Options screen on pg. 6). On the EQ282/8, left-clicking on Linked Controls allows any equalizer adjustments to affect both channels. This is effective for stereo equalization. After initial adjustments, the controls may again be un-linked, to allow fine tuning of the individual channels. The title bar across the top of the Main screen will indicate the Device #, the custom Device Name, and the model of product being controlled. The PC Control Software can operate 'off-line' (with no product connected) by opening a 'new' file for the desired product. The Device # for 'off-line' files is assigned sequentially as a negative number.



BUTTON DEFINITION SCREEN

The Button Definition screen is used to assign specific 'recall preset actions' to the Logic Inputs (and remote control buttons). Logic Inputs allow remote control of preset selection via external circuits, such as switches, contact-closures, active driver circuits, and/or 'open-collector' logic outputs (see Logic Inputs on pg. 7). From the factory, Logic Inputs 1~8 are programmed to recall presets 1~8 respectively (Channel 1 on an EQ282/8). On an EQ282/8, Logic Inputs 9~16 are programmed to recall presets 1~8 for Channel 2. On an EQ281/8, Logic Inputs 9~16 are programmed to do nothing. However, using the Button Definition screen, each Logic Input may be assigned different 'recall preset actions'. Left-clicking on a numbered button will select that Logic Input to be defined. Left-clicking on Action (Channel 1 Action or Channel 2 Action on EQ282/8) will open a drop-down menu of the available recall preset actions (for that channel). Left-clicking the desired recall preset action will then assign that action to the currently selected Logic Input. An EQ282/8 can have a single Logic Input defined to recall presets for both Channel 1 & Channel 2. Since Logic Inputs are controlled by switches, contact-closures, etc., each Logic Input may be assigned certain recall preset actions to perform when the switch is 'opened', and different recall preset actions to perform when that switch is 'closed'. The Button Definition screen also includes the ability to assign specific recall preset actions to be performed each time the equalizer is powered up. Left-clicking Power Up Actions selects this function to be defined. Power Up Actions are then assigned in exactly the same way as they would be for a Logic Input. From the factory, the equalizers have no Power Up Actions assigned. When an equalizer is powered up, and no Power Up Actions have been assigned, the equalizer will automatically recall the last settings which existed before it was powered off. Left-clicking on Echo Character opens a drop-down menu, which allows the 'echo' character for the selected Logic Input to be changed. This is the RS-232 equivalent ASCII character which will be transmitted via the Serial Port, whenever that Logic Input is switched. From the factory, no echo characters are assigned to Logic Inputs 1~16. Changing the echo character is used primarily for customizing remote control commands amongst various RS-232 controlled products within a system (see RS-232 Control on pg. 8). ***NOTE:*** *. Unlike other remote controls, the equalizer Logic Inputs do not include a 'repeat' function. Therefore, a Logic Input in an 'opened' or 'closed' state will not continuously repeat an echo character via RS-232.* Although the equalizers do not accept infrared or wall-mount remote controls themselves, they can still receive echo characters (via RS-232) from other ADVANTAGE® products which are utilizing these types of remote controls. From the factory, Remote Control Buttons have equivalent ASCII characters permanently assigned to them (see RS-232 Control on pg. 8). Therefore, recall preset actions can be assigned to Remote Control Buttons in the same way they are assigned to Logic Inputs. Left-clicking on Clear opens a drop-down menu, which allows recall preset actions to be cleared from the selected Logic Input (or all Logic Inputs). Left-clicking on Default opens a drop-down menu, which allows recall preset actions to be set back to the factory default for the selected Logic Input (or all Logic Inputs). Left-clicking on Try It causes the recall preset actions currently assigned to the selected Logic Input to be performed by the equalizer. Left-clicking on Help provides additional instruction. Left-clicking on Close will close the Button Definition screen.


Advantage EQ282/8 Configuration Options
Serial Number:
Firmware Version: (offline)
Device Name:
(30 characters max)
Bypass mode also sets the level control to unity gain.
Bypass mode also sets the high-pass and low-pass filters to their extremes .
Bypass mode also sets the pink-noise level to unity gain (SMS200 only).
Restore Defaults
Help
Close

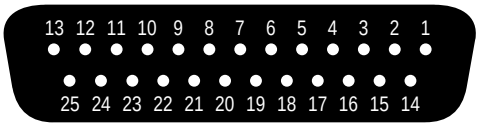
CONFIGURATION OPTIONS SCREEN

The Configuration Options screen is used to select options which customize the operation of the equalizer. At the top of the Configuration Options screen, the Serial Number and Firmware Version of the equalizer will be displayed. The PC Control Software can operate 'off-line' (with no product connected) by opening a 'new' file for the desired product. The Serial Number and Firmware Version are not displayed for 'new' ('off-line') files. Left-clicking on Device Name allows a custom name to be given to the particular equalizer, by entering up to 30 characters of text. The Device Name will be stored in the equalizer memory, and will be displayed on the title bar of the Main screen whenever that equalizer is accessed with the software. Left-clicking on Bypass mode also sets the level control to unity gain will remove the check-mark, and thereby prevent Bypass from changing any current input level settings. Left-clicking on Bypass mode also sets the high-pass and low-pass filters to their extremes will remove the check-mark, and thereby prevent Bypass from changing any high-pass filter or low-pass filter frequency settings. Left-clicking on Restore Defaults will set all Configuration Options back to their factory defaults.

LOGIC INPUTS

Sixteen Logic Inputs are available on a rear panel 25-pin Sub-D (female) connector. Logic Inputs allow remote control of preset selection via external circuits, such as switches, contact-closures, active driver circuits, and/or 'open-collector' logic outputs. From the factory, Logic Inputs 1~8 are programmed to recall presets 1~8 respectively (Channel 1 on an EQ282/8). On an EQ282/8, Logic Inputs 9~16 are programmed to recall presets 1~8 for Channel 2. On an EQ281/8, Logic Inputs 9~16 are programmed to do nothing. However, Logic Inputs may be individually programmed to perform other functions, using the PC Control Software and serial cable provided with the equalizer (see Setup on pg. 4). Since Logic Inputs are controlled by switches, contact-closures, etc., each Logic Input may be assigned two functions (one for switch 'closed' and one for switch 'open'). Logic Inputs may be programmed to have no effect on the equalizer, but instead trigger ASCII characters which affect other ADVANTAGE® products via RS-232 (see RS-232 Control on pg. 8).

Logic Inputs have the following pin assignments (right-to-left & top-to-bottom)**: Pins 1~16)** Logic Inputs 1~16; **Pins 17~25)** Ground.

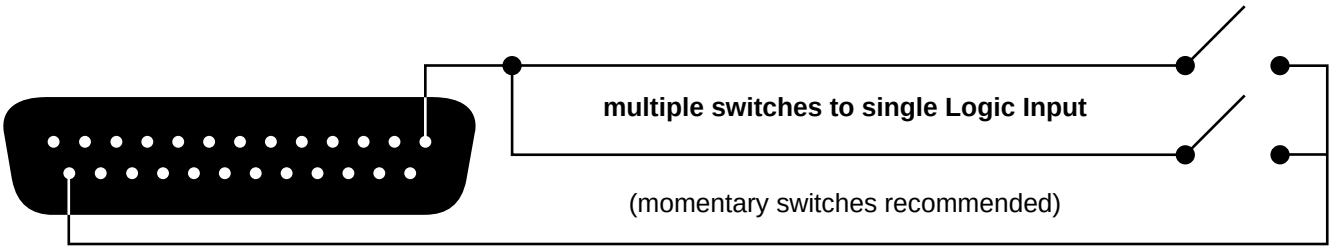


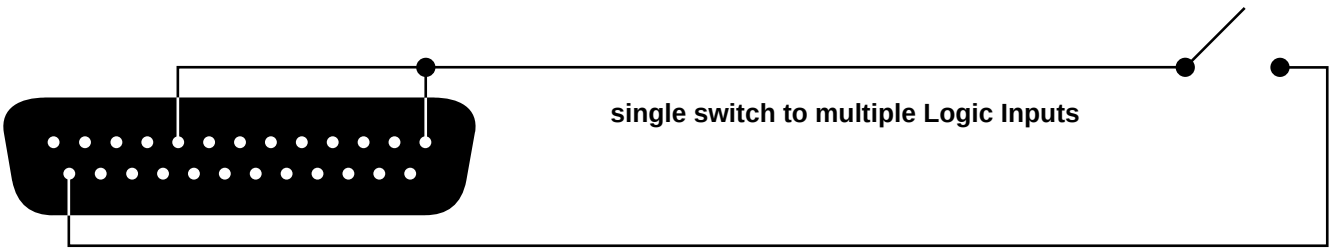
logic inputs

Pins	Functions	Factory Programming
#1~8	Logic Inputs 1~8	Preset Select 1~8 (channel 1 - EQ282/8)
#9~16	Logic Inputs 9~16	Preset Select 1~8 (channel 2 - EQ282/8)
#17~25	common ground	switch ground points (not programmable)

When nothing is connected to a Logic Input, an internal pull-up resistor keeps it at a 'high' idle state (+5.0 VDC). The Logic Input is activated when its input goes 'low' (less than +0.8 VDC), and is de-activated when its input goes 'high' (greater than +2.4 VDC). A Logic Input is controlled in one of three ways: 1) Use an NPN style 'open-collector' logic output from an external device (such as an ADVANTAGE® PMX84 or DRC4+4) to short the Logic Input to ground. 2) Use a switch, relay, or other contact-closure (such as from a third-party controller) to short the Logic Input to ground. 3) Use an active TTL output driver circuit (such as from a third-party controller) to actively drive the Logic Input to a 'high' or 'low' state.

Multiple contact-closures or 'open-collector' logic outputs or may be wired in parallel to a single Logic Input (see diagram below). Likewise, a single contact-closure or 'open-collector' logic output may be wired in parallel to multiple Logic Inputs. However, these circumstances may be rare, since the Logic Inputs can be individually programmed for specific preset selections. Logic Outputs and contact-closures should be rated for at least 5 Volts / 1mA operation. Low-current / dry-contact closures are recommended for reliability. Active output driver circuits should not exceed a signal range of 0~5 Volts DC, and should have a minimum pulse width of 100 milli-seconds. Logic Input impedances are approximately 10k ohms.





RS-232 CONTROL

The EQ281/8 & EQ282/8 have an RS-232 compatible Serial Port, which allows them to be controlled by a computer (see Rear Panel: Serial Port on pg. 3). In addition to the PC Control Software, the EQ281/8 & EQ282/8 offer two other methods of computer control.

Control Button Emulation: This method allows the computer to emulate the operation of an ADVANTAGE® infrared or wall-mount push-button remote control. Using this method, the computer outputs ASCII characters, which are equivalent to pressing 'buttons' on a remote control. Control Button Emulation allows the computer to utilize up to forty button definitions (see Setup on pg. 5). When using up to four devices in a system, Control Button Emulation also allows the computer to designate which device or devices should react to each control button command. ***NOTE:*** *Although the EQ281/8 & EQ282/8 do not accept infrared or wall-mount remote controls themselves, they can still receive the corresponding ASCII characters from other ADVANTAGE® products which are utilizing these types of remote controls.*

Advanced Computer Control: This method provides advanced commands, which allow the computer to retrieve or edit level & equalizer settings, presets, control button definitions, and a variety of other functions. The computer may also emulate control buttons. Using this method, the computer may designate up to sixty-four devices, and may create unlimited presets. The computer may also provide 'real-time' display of equalizer settings.

This manual only describes the Control Button Emulation method of computer control. For complete details about using the equalizers with a computer, including Advanced Computer Control, contact Biamp Systems for the manual "Computer Control of EQ281/8 & EQ282/8".

Each push-button on an ADVANTAGE® infrared or wall-mount remote control corresponds to one character in the standard ASCII character set. The character equivalents are summarized in the following table. This table includes all forty of the possible buttons, their button numbers, their ASCII code equivalents, and their factory default button definitions (see Setup on pg. 5). ***NOTE:*** *From the factory, there are no functions assigned to any of the control buttons.*

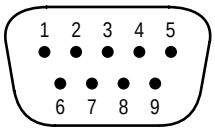
button 01	B	NOP (no operation)	button 15	P	NOP (no operation)	button 29	^	NOP (no operation)
button 02	C	NOP (no operation)	button 16	Q	NOP (no operation)	button 30	_	NOP (no operation)
button 03	D	NOP (no operation)	button 17	R	NOP (no operation)	button 31	'	NOP (no operation)
button 04	E	NOP (no operation)	button 18	S	NOP (no operation)	button 32	b	NOP (no operation)
button 05	F	NOP (no operation)	button 19	T	NOP (no operation)	button 33	c	NOP (no operation)
button 06	G	NOP (no operation)	button 20	U	NOP (no operation)	button 34	d	NOP (no operation)
button 07	H	NOP (no operation)	button 21	V	NOP (no operation)	button 35	e	NOP (no operation)
button 08	I	NOP (no operation)	button 22	W	NOP (no operation)	button 36	f	NOP (no operation)
button 09	J	NOP (no operation)	button 23	X	NOP (no operation)	button 37	g	NOP (no operation)
button 10	K	NOP (no operation)	button 24	Y	NOP (no operation)	button 38	h	NOP (no operation)
button 11	L	NOP (no operation)	button 25	Z	NOP (no operation)	button 39	i	NOP (no operation)
button 12	M	NOP (no operation)	button 26	[	NOP (no operation)	button 40	j	NOP (no operation)
button 13	N	NOP (no operation)	button 27	\	NOP (no operation)			
button 14	O	NOP (no operation)	button 28	]	NOP (no operation)			

The computer can initiate any functions that are assigned to a control button or Logic Input, by simply transmitting the equivalent control button ASCII character. When interfacing the equalizer to a computer, the computer must be aware that the equalizer will 'echo' all characters it receives (both from computer and Logic Inputs) via the Serial Port Transmit Data (TXD) output signal.

When using Control Button Emulation, up to four ADVANTAGE® products may be connected together, and addressed individually,. When multiple units are used, each unit is assigned a unique "Device #" (see Rear Panel: Device # on pg. 3). Normally, all units would react to control button commands. However, a computer can send commands to specific units, by preceding each command with a "device select prefix" character (see following table). Only those units whose Device #s are specified will respond to the command which follows. If a command is not immediately preceded by a device select prefix character, then all units in the system will react to that command.

Select Device 1	l	Select Devices 2 & 3	q	Select Devices 1 & 2 & 4	v
Select Device 2	m	Select Devices 1 & 2 & 3	r	Select Devices 3 & 4	w
Select Devices 1 & 2	n	Select Device 4	s	Select Devices 1 & 3 & 4	x
Select Device 3	o	Select Devices 1 & 4	t	Select Devices 2 & 3 & 4	y
Select Devices 1 & 3	p	Select Devices 2 & 4	u	Select Devices 1 & 2 & 3 & 4	z

Serial Port: The 9-pin Sub-D (male) connector on the equalizer rear panel provides the RS-232 compatible serial interface signals used for computer control. The Serial Port transmits serial data on pin 3 (TxD), receives serial data on pin 2 (RxD), and provides a ground on Pin 5. The Data Terminal Ready (DTR) & Request To Send (RTS) output signals are connected to a positive voltage source (through a resistor) and are always asserted when the equalizer power is on. ***NOTE:*** *The Serial Port will also transmit commands which are received via the Logic Inputs*



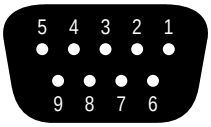
pin #1 = not used
pin #2 = Receive Data (RxD) input
pin #3 = Transmit Data (TxD) output
pin #4 = Data Terminal Ready (DTR) output
pin #5 = ground
pin #6 = not used
pin #7 = Request To Send (RTS) output
pin #8 = not used
pin #9 = not used

serial port

The equalizer only requires receive data (pin 2), transmit data (pin 3), and signal ground (pin 5) to be connected for successful data communications (see cable diagram below). However, the PC may require that signals be present on the data set ready, clear to send, or carrier detect inputs, as well as the receive data, transmit data, and signal ground pins. Success or failure depends entirely on the actual computer hardware and software being used. When trying to solve an interfacing problem, the most important thing to remember is that an output of one device should connect to one or more inputs of the other device, and that two outputs should never be connected together. Also, keep in mind that the RS-232 specification calls for the cable length to be no greater than 50 feet (although it is not unusual to be able to operate over distances of 150 to 250 feet), and the connectors must be of the appropriate gender (male or female) to mate properly. For best results, a shielded cable should be used, with the shield connected to signal ground. Since the equalizer serial interface ground is also tied (indirectly) to the analog signal ground, undesirable ground loops may occur when the equalizer is connected to a PC (if the system grounding is not carefully designed). For best performance, the PC ground and the chassis ground of the equalizer should be at the same potential, and the PC should get AC power from the same source as the equalizer (and any other audio equipment which is connected to the equalizer).

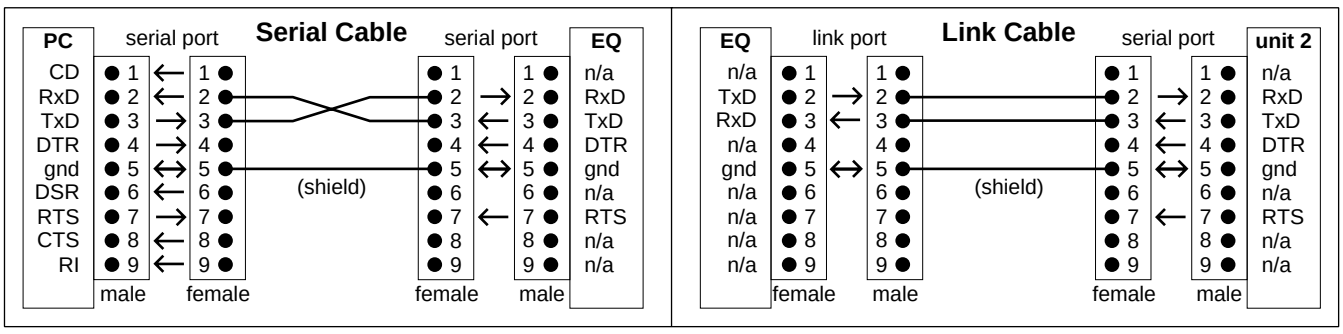
Serial Port Data Communications Parameters: The equalizer communicates through the Serial Port at the factory selected rate of 9600 bits per second, with 8 data bits, 1 stop bit, and no parity. The equalizer utilizes a subset of the standard 7-bit ASCII character set. The eighth data bit of each character (the most significant bit) should always be 0. The computer should not echo the characters it receives. The computer should not be set for either hardware (DTR) or software (XON/XOFF) flow control. The baud rate may be changed to either 2400 or 19,200 bits per second by means of the rear panel Baud Rate DIP switches.

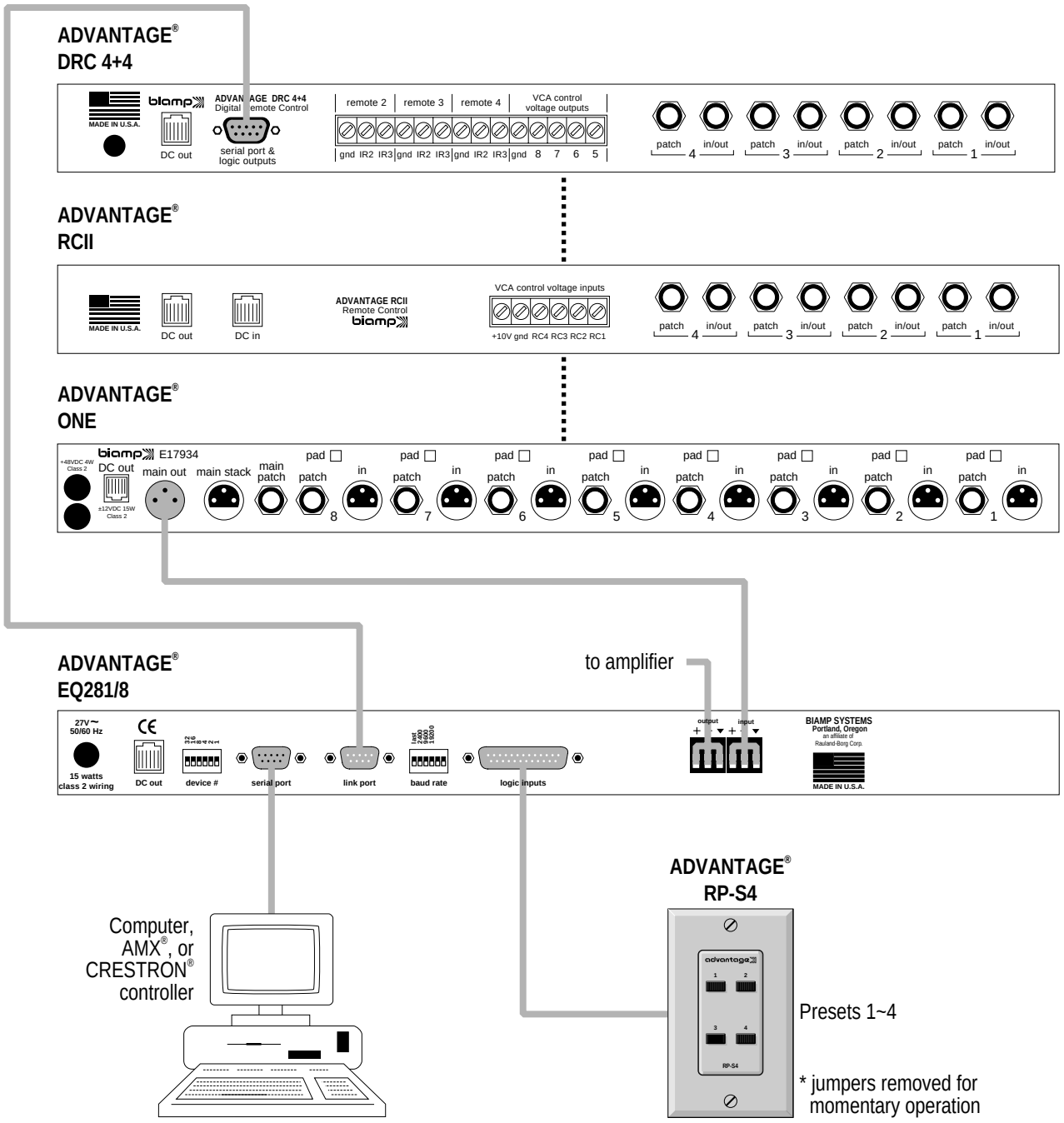
Link Port Connections: The 9-pin Sub-D (female) connector on the equalizer rear panel provides the RS-232 compatible serial interface signals used for linking multiple ADVANTAGE® products within a system. The Link Port of one device simply connectes to the Serial Port of the next device, and so forth (see diagram below). Link cables are available as an option (Biamp #909-0057-00). ***NOTE:*** *All but the final device in a system should have its '<u>last</u>' switch down (see Rear Panel: Baud Rate on pg. 3). The Link Port will also transmit commands which are received via the Logic Inputs.*



pin #1 = not used
pin #2 = Transmit Data (TxD) output
pin #3 = Receive Data (RxD) input
pin #4 = not used
pin #5 = ground
pin #6 = not used
pin #7 = not used
pin #8 = not used
pin #9 = not used

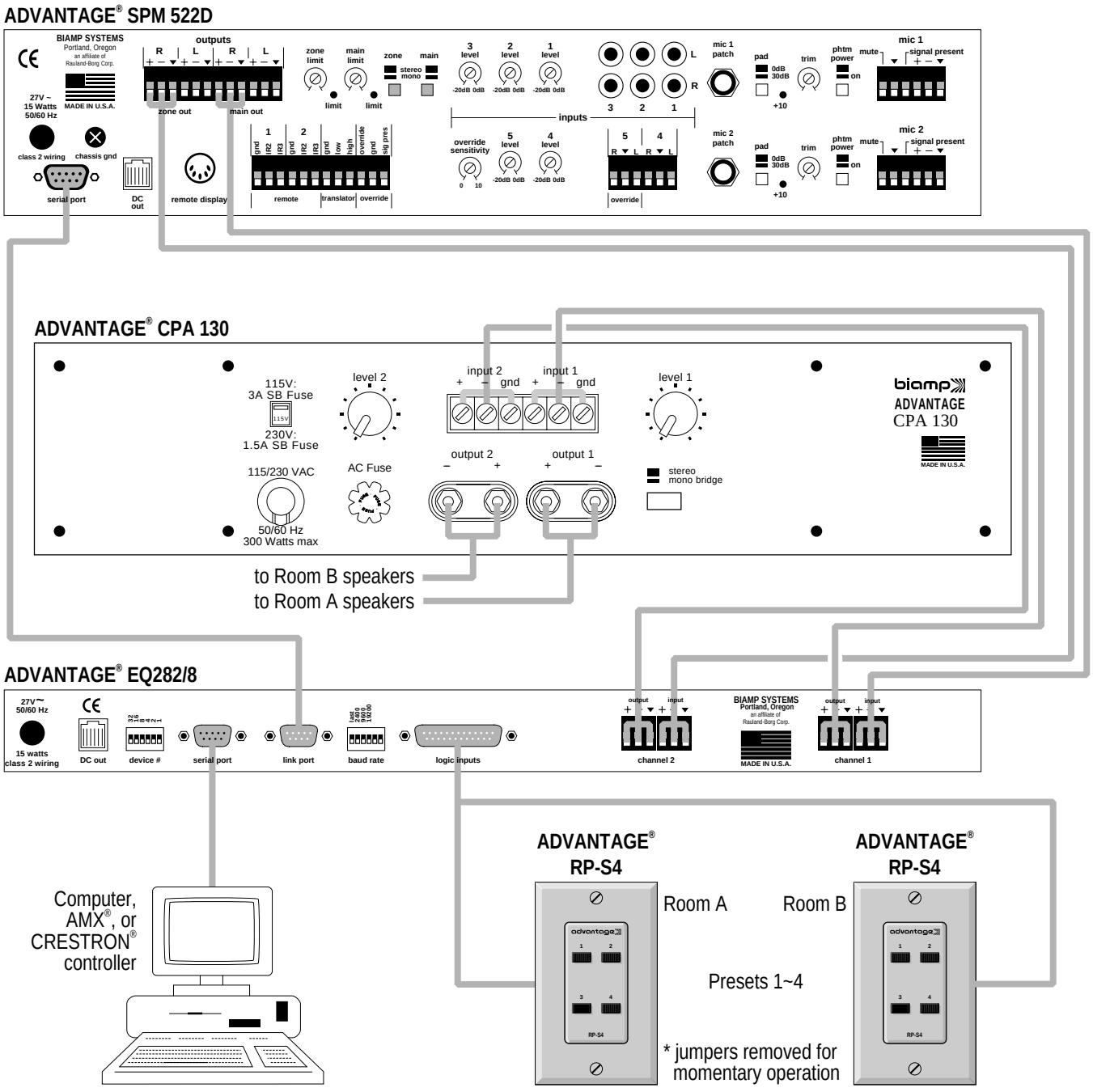
link port





Equalization and Remote Control of a Mono Sound System

This application shows an ADVANTAGE® ONE, an ADVANTAGE® DRC 4+4, and an ADVANTAGE® RCII connected together to provide an eight input mic/line mixer with remote control of channel levels. This could be any mono sound system. The EQ281/8 provides up to eight selectable preset equalization curves, to accommodate changes in acoustics or program material. An ADVANTAGE® RP-S4 is connected to the EQ281/8 Logic Inputs for selecting Presets 1~4. A custom switch panel can be used to access all eight presets. The EQ281/8 Link Port is connected to the DRC 4+4 Serial Port. This allows remote control and preset selection, not only of equalization, but of channel levels as well. Equalization and channel levels are controlled via RS-232, while only preset selection is controlled via switches.



Equalization of a Mono Sound System with Two Zones

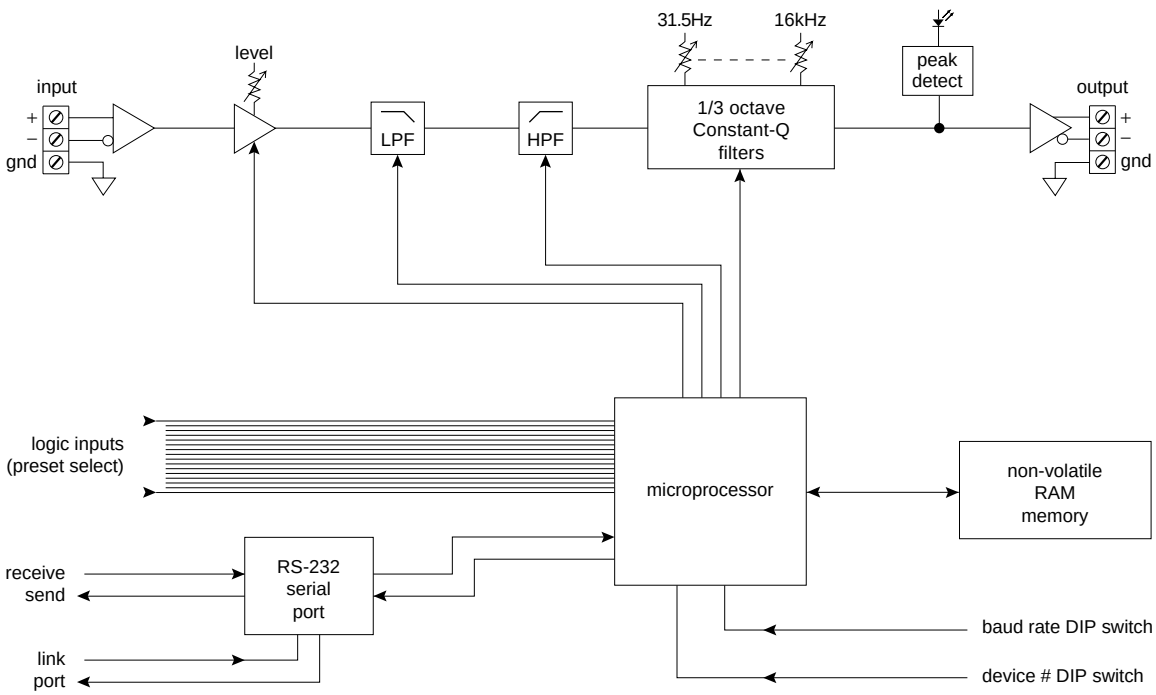
This application shows an ADVANTAGE® SPM522D providing program source & mic/line mixing to two independent mono outputs for Room A & Room B sound systems, with an ADVANTAGE CPA130 providing power for the speakers in each room. This could be any mono sound system with two zones. The EQ282/8 provides up to eight selectable preset equalization curves per room, to accommodate changes in acoustics or program material (including room combining). Two ADVANTAGE® RP-S4s are connected to the EQ282/8 Logic Inputs for selecting Presets 1~4 in each room. Custom switch panels can be used to access all eight presets per room. The EQ282/8 Link Port is connected to the SPM522D Serial Port. This allows remote control and preset selection, not only of equalization, but of sources and levels as well. Equalization, sources and levels are controlled via RS-232, while only preset selection is controlled via switches.

SPECIFICATIONS & BLOCK DIAGRAM

Frequency Response (20Hz~20kHz @ +4dBu)**:**	+0/-0.5dB
THD + Noise (20Hz~20kHz @ +4dBu)**:**	<0.01%
Intermodulation Distortion (SMPTE)**:**	<0.01%
Hum & Noise (20Hz~20kHz @ unity, filters flat)**:**	-88dBu
Dynamic Range (20Hz~20kHz)**:**	109dB
Input Impedance (balanced)**:**	>10k ohms
Maximum Input Level:	+19dBu
Output Impedance (balanced)**:**	200 ohms
Maximum Output Level (balanced into 600Ω)**:**	+24dBu
High-Pass Filter (12dB/octave - programmable)**:**	9.1Hz~171.9Hz
Low-Pass Filter (12dB/octave - programmable)**:**	1.9kHz~34.7kHz

Filter Frequencies (ISO centers)**:**	31.5Hz~16kHz
Filter Gain Range (programmable)**:**	±12dB in 1dB steps or
	±6dB in 0.5dB steps
Input Gain Range (programmable)**:**	±12dB & off
Power Requirements:	120/240VAC
Power Consumption:	15 watts max.
Dimensions:	
Height (1 rack space)	1.75 inches (44mm)
Width	19 inches (483mm)
Depth	7 inches (178mm)
Weight:	7 lbs. (3.18kg)

EQ281/8 & EQ282/8
Block Diagram
(one channel shown)



WARRANTY

BIAMP SYSTEMS IS PLEASED TO EXTEND THE FOLLOWING 5-YEAR LIMITED WARRANTY TO THE ORIGINAL PURCHASER OF THE PROFESSIONAL SOUND EQUIPMENT DESCRIBED IN THIS MANUAL.

BIAMP Systems expressly warrants this product to be free from defects in material and workmanship for a period of 5 YEARS from the date of purchase as a new product from an authorized BIAMP Systems dealer under the following conditions.

1. The Purchaser is responsible for completing and mailing to BIAMP Systems, within 10 days of purchase, the attached warranty application.

2. In the event the warranted BIAMP Systems product requires service during the warranty period, BIAMP Systems will repair or replace, at its option, defective materials, provided you have identified yourself as the original purchaser of the product to any authorized BIAMP Systems Service Center. Transportation and insurance charges to and from an authorized Service Center or the BIAMP Systems factory for warranted products or components thereof to obtain repairs shall be the responsibility of the purchaser.

3. This warranty will be VOIDED if the serial number has been removed or defaced; or if the product has been subjected to accidental damage, abuse, rental usage, alterations, or attempted repair by any person not authorized by BIAMP Systems to make repairs; or if the product has been installed contrary to BIAMP Systems's recommendations.

4. Electro-mechanical fans, electrolytic capacitors, and the normal wear and tear of appearance items such as paint, knobs, handles, and covers are not covered under this warranty.

5. BIAMP SYSTEMS SHALL NOT IN ANY EVENT BE LIABLE FOR SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, INCLUDING LOST PROFITS, LOSS OF USE, PROPERTY DAMAGE, INJURY TO GOODWILL, OR OTHER ECONOMIC LOSS OF ANY SORT. EXCEPT AS EXPRESSLY PROVIDED HEREIN, BIAMP SYSTEMS DISCLAIMS ALL OTHER LIABILITY TO PURCHASER OR ANY OTHER PERSONS ARISING OUT OF USE OR PERFORMANCE OF THE PRODUCT, INCLUDING LIABILITY FOR NEGLIGENCE OR STRICT LIABILITY IN TORT.

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